REMARKS/ARGUMENTS

The specification is amended to correct certain reported data.

With respect to Tables 1 and 5, Ir-1 is missing in each of Organic EL element 1-1-5 in Table 1 and Organic EL element 2-1-7 in Table 5, due to clerical errors. Since no light emitting group is contained in Poly-13, a light emitting dopant is necessary to emit light. In Tables 1 and 5, Ir-1 is used as a light emitting dopant.

New claims are added:

With respect to new claims 28 - 31, claims 28 - 31 are supported by PO-11, PO-12 and PO-13 shown in page 49 of the present Specification.

Rejections:

Claim 2 is cancelled, thereby rendering its rejection moot.

Claims 1, 2 and 11-14 are rejected under 35 U.S.C. 102(a) as being anticipated by Kita et al. (JP 2004-185967).

An anticipated rejection requires that each feature be present or inherent in the art. The Examiner states that A-24 of

Kita et al. ([0064]) meets Formula (1) of the present Application.

However, A-24 of Kita et al. contains a -C(=O)- group in addition to the phenylcarbazole group and L1 containing a -O- group in the main chain. A -C(=O)- group forms an ester group in combination with an -O- group, namely, a polyester compound, which is a definitely different compound from the compound having a repeat unit represented by Formula (1) of the present Application.

In each of Formulae (1) - (4) of Kita et al., at least two groups selected from A - E are contained in addition to the linkage group(s). Accordingly, no repeating unit represented by Formula (1) *-(-Ar_1-L_1-)n1-* of the present Application can be formed by any of Formulae (1) - (4) of Kita et al.

Accordingly, Claim 1 is not anticipated by Kita et al.

It is therefore submitted that Claim 1 and sub-claims dependent on Claim 1, namely, Claims 11 - 14, are not anticipated by Kita et al.

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Claims 3-7, 9, 10, 15-17, 19-21 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takimoto et al. (US 5,331,182A) in view of Tokito et al. (US 2003/0091862 A1).

Claims 3, 4, 6, 7, 8, 9, 10, 15-17, 19-21 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takimoto et al. (US 5,331,182A) in view of Ikehira et al. (US 2002/0193532 A1).

The Examiner considers that, for each rejection primary reference Takimoto teaches the claimed invention except for "the polymer containing pendant chains attached to Ar_2." For this the secondary references are cited to provide the missing teaching, for obvious results.

With respect to claim 3, the Examiner states in pages 4 - 5 of the outstanding Office Action that Takimoto et al. (US 5,331,182 A) disclose a polymer with arylene units Ar_2 (column 8, lines 45-65) and L_2 units O, S, Se, or Te (column 2, line 59),

and wherein n is not less than 2 (column 2, line 59), while Takimoto et al. does not explicitly disclose the polymer containing pendent chains attached to Ar_2, the Examiner reasons that this teaching is provided by combining Tokito et al. (US 2003/0091862 A1) for teaching attaching pendent chains of hole transport compounds [0090], such as carbazole ([0090] HT-1) and phenylcarbazole ([0095], first side chain in polymer P3), and phosphorescent complexes [0106] to the polymer backbone. The Examiner concludes that it would be obvious to one of ordinary skill in the art at the time of the invention to combine the hole transport compounds and phosphorescent complexes pendent chains as taught by Tokito et al. with the polymer of Takimoto et al.

With respect to the rejection based on Takimoto et al in view of Ikahira et al, the Examiner similarly states (on pages 6 - 7 of the outstanding Office Action), that Ikehira Ikehira et al. (US 2002/0193532) teach attaching pendent chains of phosphorescent complexes to the polymer backbone [0044], the phosphorescent organometallic complexes having partial structures of instant formulae (5) and (7) [0044], and that it would be obvious to one of ordinary skill in the art at the time of the

invention to combine the phosphorescent complexes as taught by Ikehira et al. with the polymer of Takimoto et al.

However, there is evidence of record (in Tables 5 (page 106) and 7 (page 107) of the present Application), that clearly demonstrates that, when a carbazole group (a hole transport group) is attached to the main chain of the repeating unit represented by Formula (2) of the present Application as a pendent chain, namely, attached to Ar_2 of Formula (2) (Organic EL Element 2-1-7 in Tables 5 and 7), unexpectedly excellent properties were obtained compared to when the same carbazole group is attached to the main chain of a vinyl polymer as a pendent chain (Organic EL Element 2-1-1 in Tables 5 and 7) which is also disclosed by Tokito et al. ([0095], first side chain in polymer P1). These results are not shown or suggested by the combined teaching of Takimoto et al. with Tokito et al (or with Ikahira).

Further comparison examples of polymers exhibiting unexpected superiority while containing repeating units represented by Formula (2) of the present Application are presented in the 1.132 Declaration enclosed herewith.

The comparison conducted in each of Combinations 1 and 2 described in the enclosed 1.132 Declaration showed that a polymer having a repeat unit in which a hole transport group such as a phenyl carbazol is pendent to a polymer chain as represented by Formula (2) of the present Application exhibits an unexpectedly higher external quantum efficiency, an unexpectedly longer emission life and an unexpectedly lower driving voltage, when compared with a polymer having a repeat unit in which the same hole transport group is pendent to a vinyl polymer chain as taught by Tokito et al.

The comparison conducted in Combination 3 described in the 1.132 Declaration showed that a polymer having a repeat unit in which an electron transport group such as a phenyl carboline is pendent to a polymer chain as represented by Formula (2) of the present Application exhibits an unexpectedly higher external quantum efficiency, an unexpectedly longer emission life and an unexpectedly lower driving voltage, when compared with a polymer having a repeat unit in which the same electron transport group is pendent to a vinyl polymer chain as taught by Tokito et al.

The comparison conducted in Combination 4 described in the 1.132 Declaration also showed that a polymer having a repeating unit in which an electron transport group such as TPBI is pendent to a polymer chain as represented by Formula (2) of the present Application exhibits an unexpectedly higher external quantum efficiency, an unexpectedly longer emission life and an unexpectedly lower driving voltage, when compared with a polymer having a repeat unit in which the same electron transport group is pendent to a vinyl polymer chain as taught by Tokito et al.

The comparison conducted in Combination 5 described in the enclosed 1.132 Declaration shows that a polymer having a repeating unit in which a hole transport group such as a carbazole is pendent to a polymer chain of the present Application exhibits an unexpectedly higher external quantum efficiency, an unexpectedly longer emission life and an unexpectedly lower driving voltage, when compared with a polymer having a repeat unit in which the same hole transport group is pendent to a conjugated polymer chain as taught by Ikehira et al. (for example, refer to [0044]).

The above examples clearly demonstrated that a polymer having a repeating unit represented by Formula (2) of the present Application in which a variety of functional groups is pendent to a polymer chain as represented by Formula (2) of the present Application exhibits an unexpectedly higher external quantum efficiency, an unexpectedly longer emission life and an unexpectedly lower driving voltage, when compared with a polymer having a repeat unit in which the same functional group is pendent to a vinyl polymer chain as taught by Tokito et al. or to a conjugated polymer chain as taught by Ikehira et al.

Accordingly, the polymer having one of repeating units represented by Formula (2) of the present Application is not obvious over Takimoto et al. either in view of Tokito et al. or Ikehira et al.

Therefore, Claim 3 is not shown or suggested by either combination relied on by the Examiner.

Since Claims 4 - 8 and 15 - 18 are dependent on Claim 3, these claims are also allowable. (Adding the teaching of Spreitzer to Takimoto and Tokita (i.e. Claim 8 rejection) does not provide the missing teaching).

Lee combined with each primary combination discussed above (Claims 18-22 and 26 rejection) also fails to provide missing teaching. Accordingly, as detailed above, Claims 9 and 10, and sub-claims thereof, namely, Claims 19-22 dependent to Claim 9 and Claims 23-26 dependent to Claim 10 are also allowable.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takimoto et al. (US 5,331,182A) in view of Pei (US 2003/0013843 A1).

The Examiner relies on Pei for teaching specific substituents which are suitable for use on phenyl and teaches alkyl groups of the formula C_nH_{2n+1} [0064] as suitable.

Pei teaches conjugated polymers that have good solubility and semiconductivity (abstract of Pei).

Referring again to the data in the enclosed 1.132 Declaration, the comparison of Organic EL elements 2-4-1 and 2-4-2 in Tables 11 and 12 in the 1.132 Declaration clearly shows that, when a hole transport group (a carbazolyl group) is pendent to a polymer chain of the present Application, an extremely higher external quantum efficiency was observed compared to when the same group is pendent to a conjugated polymer chain. Thus,

the nature of a polymer having a conjugated repeat unit when used in an organic EL element is quite different from a polymer having the repeat unit of the present application.

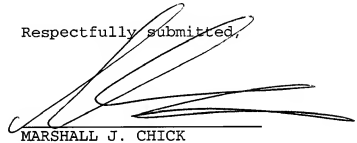
Accordingly, Ar-63 as Ar-1 in Formula (1) is not obvious over the phenyl group having a substituent of C_nH_{2n+1} of Pei ([0084]).

Accordingly, Claim 27 is not shown or suggested by this combination.

With respect to new claims 28 - 31, referring to the evidence in the enclosed 1.132 Declaration, the unexpectedly high external quantum efficiency, unexpectedly long emission life and unexpectedly low driving voltage exhibited by a polymer containing a repeating unit of each of PO-11, PO-12 and PO-13 are clearly demonstrated in Organic EL elements 2-1-14, 2-1-15 and 2-1-17 in Tables 5-continued and 7-continued given in the 1.132 Declaration, by comparing with Organic EL elements 2-1-18 and 2-1-19, evidences the non-obviousness of these claims over the references.

The unexpectedly good results detailed above, provides evidence that the present claims are not obvious over any combination of art relied on by the Examiner. Allowance of the application is therefore respectfully requested.

Respectfully submitted,



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Encs.: Petition for Extension of Time (3 months) and Fee
RCE and Fee
Declaration Under 37 CFR 1.132 (Hideo Taka)